

MUON CRYOSYSTEM DESIGN NOTE 16

SUBSYSTEM: ☐ CCM ☐ CVM ☒ Cryoplant

TITLE: Ethane Hazard to Cryosystem Components

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Objective

An ethane-argon mixture is used in the drift chambers adjacent to CCM. Each of the four chambers contains seventy cubic feet of gas slightly above atmospheric pressure. These chambers are constructed of mylar sheets. Four 100 cubic foot chambers are located about 25 feet north of CCM.

Discussion

Ethane is normally contained but a flammable mixture could be released into the room. In the case of a rupture or leak the direction of gas travel is indeterminant since ethane is about the same density as air. There may be a downward preference due to the presence of denser argon.

The information from the experimenters is:

1. The drift chambers will be located and sized as the experimenters have described.
2. The makeup rate of ethane is very small, so a rupture of one chamber will spill the contents only.
3. The makeup is stopped after a leak is discovered.
4. The experimenters plan to deenergize their detectors in case of a leak.
5. The system is maintained so that normal leakage is trivial.

To address this hazard:

1. Electrical equipment that we install within ten feet of the chambers will be suitable for Class 1, Group D, Division 2. This is to meet the requirements of Article 500 of the NEC.
2. We will express our concern to the experimenters in writing.

3. We consider that the primary hazard is the draft chambers.
4. Request that additional gas detectors be installed. One in the CCM pit 10 feet below the chambers is inadequate.

REVIEWED BY:

M E Stone 4/9/86